

1969

**OPERATING
SUMMARY**

FORT ERIE

water pollution control plant

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1969
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WATER
COMMISSION

ONTARIO WATER RESOURCES COMMISSION

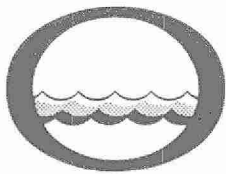
Division of Plant Operations

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Water management in Ontario

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Water Resources
Commission


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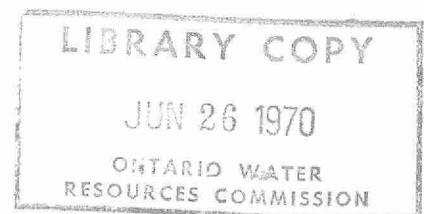
The operating efficiency and financial status of the water pollution control facilities operated for you in 1969 are presented in the following pages.

The regional operations engineer's comments and the statistical data will assist you in gauging the plant's level of performance. A new flow chart and up-to-date design data are also provided.

Various divisions and sections within the Commission have co-operated in providing what we trust is an accurate and concise annual operating summary.


D.S. Caverly,
General Manager.


D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.



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FORT ERIE
water pollution control plant

operated for

THE TOWN OF FORT ERIE

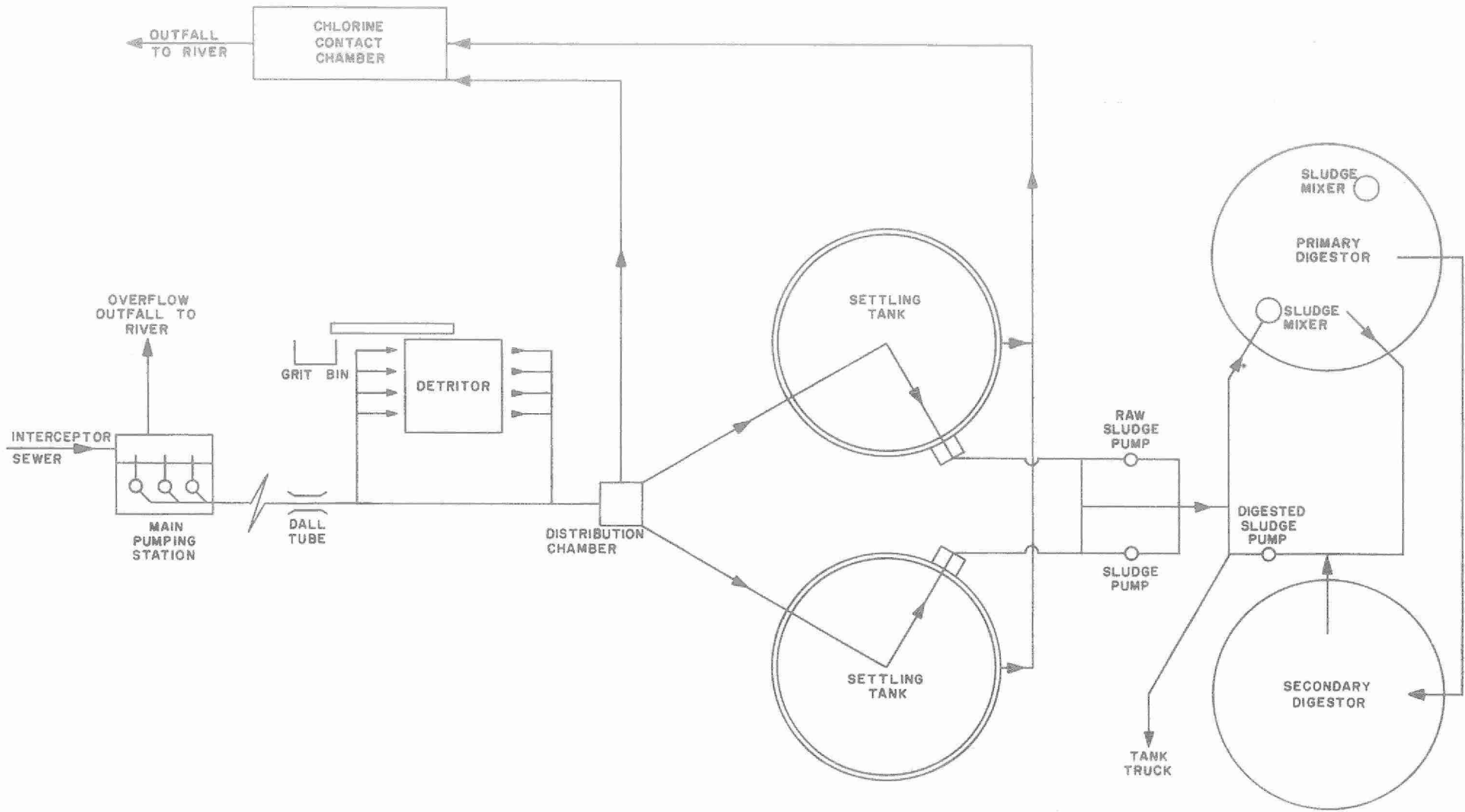
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ONTARIO WATER RESOURCES COMMISSION

1969 ANNUAL OPERATING SUMMARY

FORT ERIE SEWAGE TREATMENT PLANT

SIMPLIFIED FLOW CHART



DESIGN DATA

PROJECT NO.	2-0039-59	TREATMENT	Primary
DESIGN FLOW	1.8 mgd	DESIGN POPULATION	12,000
BOD - Raw Sewage	190 mg/l	SS - Raw Sewage	130 mg/l
- Removal	40%	- Removal	60%

MAIN PUMPING STATION

Type: Pulsometer Sterophagus pumps
(electric)

Size: Three 2060 gpm @ 32' tdl

PRIMARY TREATMENT

Screening

- Two coarse bar screens at
pumping station (2 $\frac{1}{2}$ " spacing)

Grit Removal

Type: Dorr Type WA Detritor

Size: One 12' x 12' x 1.61'
(232 cu ft or 1,445 gal)

Retention: 1.15 min

Primary Sedimentation

Type: Link Belt Type ADB-55

Size: Two 50' dia x 10' deep
(78,800 cu ft or 245,000 gal)

Retention: 3.27 hours

Loading: Surface, 458 gal/ft²/day
Weir, 5,720 gal/ft/day

CHLORINATION

Type: W & T A711 (automatic)
Size: One 2000 lb/day

Chlorine Contact Chamber

Size: 56.25' x 9.5' x 5' (2,680 cu ft or
16,700 gal)

Retention: 13.4 min

OUTFALL

1484' of 24" dia pipe to Niagara River

SLUDGE HANDLING

Digestion System

Type: Two-stage

Primary --

Type: Dorr draft tube mixers (2)
on fixed steel dome roof

Size: One 30' dia x 22' swd
(15,500 cu ft or 96,600 gal)

Loading: 2.70 lb/cu ft/mo

Secondary --

Type: Fixed steel dome roof

Size: One 30' dia x 21.5' swd
(15,200 cu ft or 94,600 gal)

Total Loading: 1.37 lb/cu ft/mo



GENERAL

A total of 596.06 million gallons was treated during 1969, an average daily flow of 1.63 million gallons. This represents 89% of the plant's design capacity.

Both the raw sewage organic strength and the plant efficiency remained relatively unchanged from 1968.

During 1969, several major renovations were carried out on project equipment. These included replacement of all underground gas piping; the overhaul and repainting of both clarifiers; the overhaul and repainting of the raw sewage pumps at Niagara Boulevard pumping station, and the installation of a new sludge recirculating pump.

These repairs and modifications were part of a maintenance program designed to ensure all plant equipment and buildings remain in top condition.

Efforts to break up and eliminate the large scum layer which has accumulated in the primary digester were only partially successful.

EXPENDITURES

The 1969 operating costs for the Fort Erie plant were \$34,664.71, an increase over 1968 of two percent.

PLANT FLOWS and CHLORINATION

The total raw sewage flow received at the plant in 1969 was 596.06 million gallons, an increase of approximately 13% over 1968 flows. The average daily flow for the year was 89% of the project's design capacity of 1.8 mgd. A maximum daily flow of 4.94 million gallons occurred in January, while a minimum daily flow of 0.83 million gallons was recorded in February. The dry weather design flow of 1.8 million gallons per day was exceeded approximately 20% of the time as compared to 30% in 1968, and 41% in 1967. This would indicate that a certain amount of success has been achieved in the municipal program of eliminating storm water from the sewage system.

Chlorine is used for effluent disinfection from May 14 to November 23 each

year. Influent chlorination is practised on a year-round basis to eliminate odours in the detritor area of the plant. During 1968, a chlorine dosage of 2.4 milligrams per litre was required to maintain a 15-minute residual of 0.5 mg/l in the final effluent.

PLANT EFFICIENCY

The average raw sewage strengths of 71 mg/l BOD and 119 mg/l suspended solids were below the design values for this plant. The average BOD and suspended solids values remained relatively constant in comparison with 1968 values. The removal efficiency of 35% BOD represented a decline in plant performance from an average removal efficiency of 54% during 1968. The removal efficiency for suspended solids remained relatively unchanged from 1968. The average effluent quality for BOD and suspended solids was 46 mg/l and 52 mg/l respectively. The average grit removed during 1969 was 0.1 cubic feet per million gallons of raw sewage, which represents a substantial decrease when compared to 0.2 cubic feet per million gallons in 1968.

SLUDGE DIGESTION and DISPOSAL

A total of 486,000 gallons of raw sludge with an average total solids content of 7.1% was pumped to the digester in 1969. This represents approximately a 10% increase in gallonage and a 3% increase in average solids content over 1968. These increases were partially offset by a 40% increase in the amount of supernatant liquid withdrawn from the digester.

During 1969, several problems were experienced with the scum build-up on the surface of the primary digester. No satisfactory method was developed to break up this layer within the digester, or to remove it. It is anticipated that in early 1970, a set of grease collection baskets will be installed in the primary clarifiers. It is expected that these baskets will prevent the grease from entering the digester.

CONCLUSIONS and RECOMMENDATIONS

The project's dry weather design capacity was exceeded less often, indicating some success in eliminating storm water from the system. The source of excessive amounts of grease has yet to be isolated, although steps are being taken at the plant to reduce its effect on the treatment system. During 1969, several major mechanical programs were completed.

The average daily flow used 89% of the plant's design capacity.

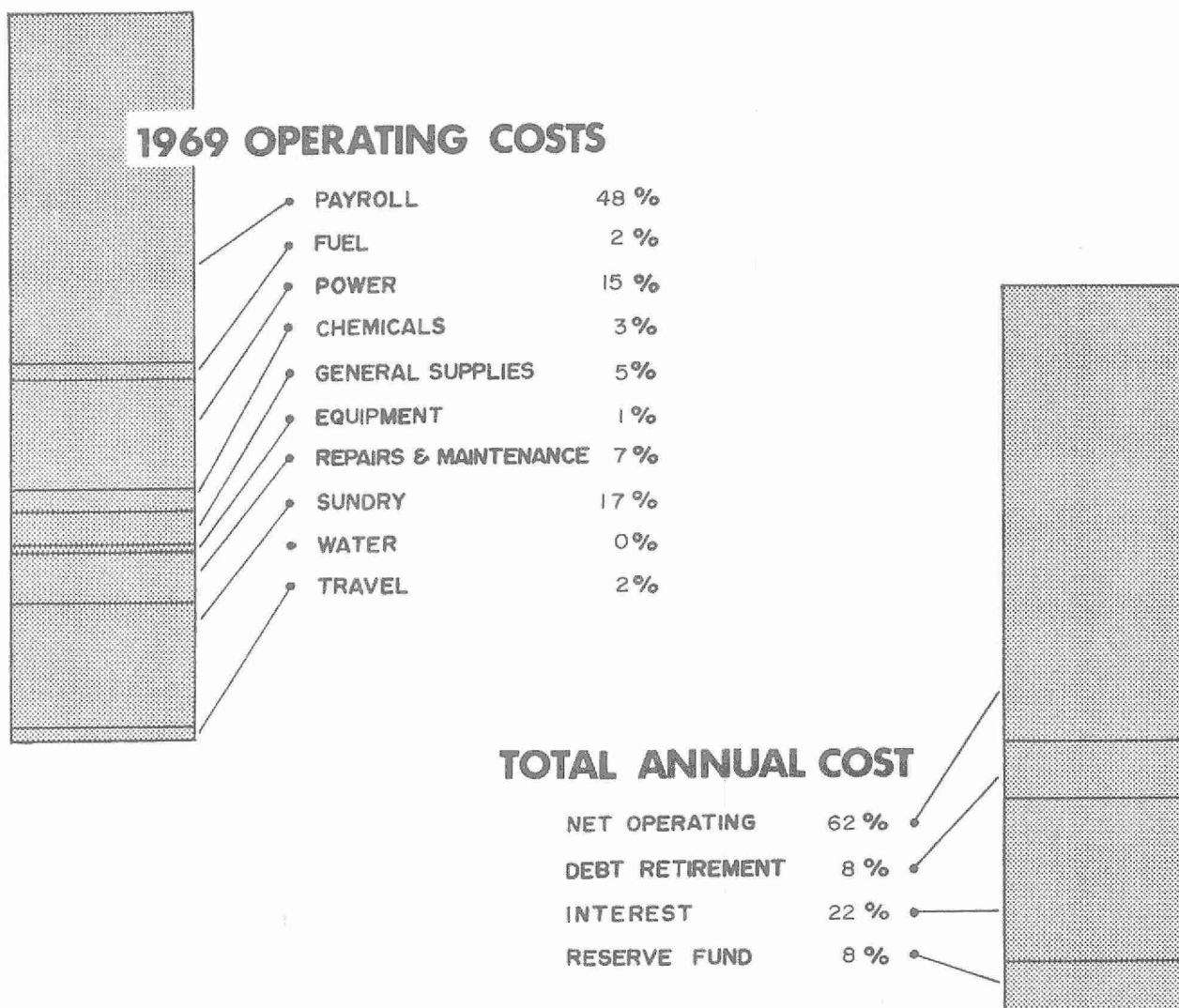
It is recommended (1) that the Town of Fort Erie emphasize a program of storm water separation; (2) that consideration be given to the expansion of the sewage treatment facilities.

PROJECT COSTS

NET CAPITAL COST (Final)		\$807,050.52
DEDUCT - Payments from Municipality	\$ 55,000.00	
- Portion financed by CMHC/MDLB (Final)	<u>535,794.31</u>	<u>590,794.31</u>
Long Term Debt to OWRC		<u>\$216,256.21</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1969		\$ <u>34,583.95</u>
Net Operating		\$ 34,664.71
Debt Retirement		4,364.00
Reserve		4,385.69
Interest Charged		<u>12,107.07</u>
TOTAL		\$ <u>55,521.47</u>

RESERVE ACCOUNT

Balance @ January 1, 1969	\$ 30,463.70
Deposited by Municipality	4,385.69
Interest Earned	<u>1,754.04</u>
	\$ 36,603.43
Less Expenditures	<u>3,779.45</u>
Balance @ December 31, 1969	\$ <u>32,823.98</u>



Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1965	535.46	\$24,836.97	\$46.38	12 cents
1966	603.50	26,123.29	43.29	19 cents
1967	620.69	27,797.55	44.78	15 cents
1968	527.08	33,844.08	64.21	16 cents
1969	596.06	34,664.71	58.16	23 cents

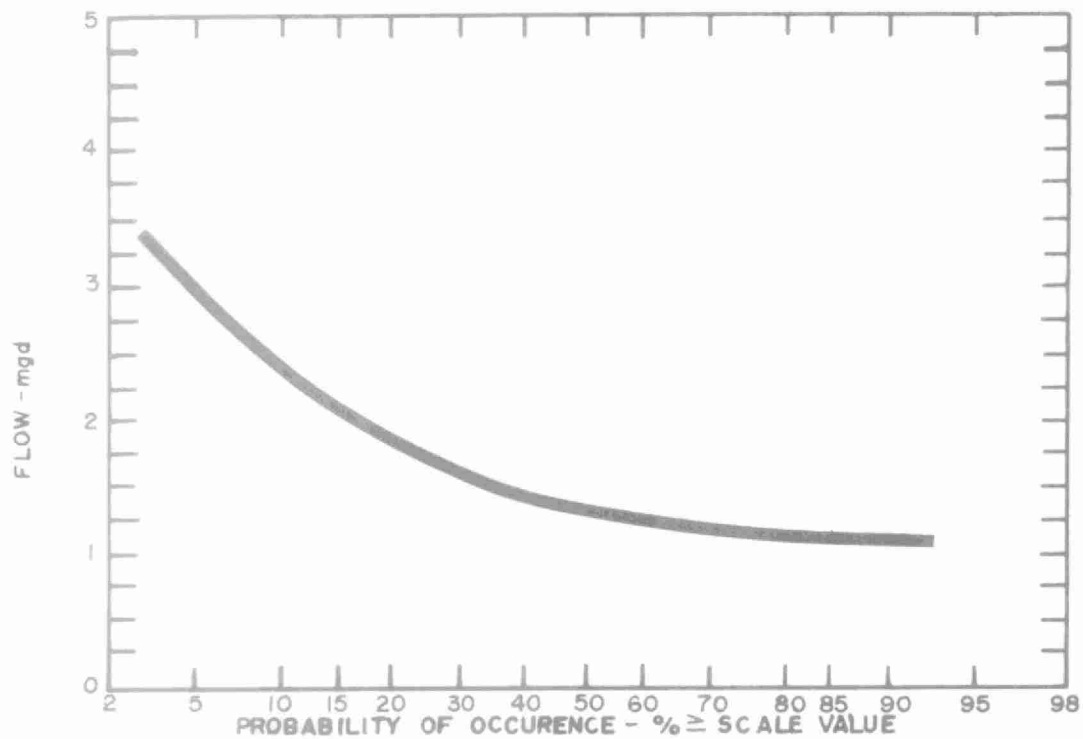
Monthly Operating Costs

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	2088.12	2006.62	-	-	-	-	19.27	-	42.20	20.03	-	-
FEB	2451.96	1204.79	-	97.98	492.93	-	68.25	-	293.16	227.15	-	65.70
MAR	2084.72	1128.29	-	104.73	446.85	-	122.24	-	167.79	78.82	-	36.00
APR	2439.48	1283.78	-	95.12	404.28	-	185.00	145.73	247.47	29.50	-	48.60
MAY	2490.98	1305.47	-	73.84	497.01	-	189.50	-	286.76	90.85	-	47.55
JUNE	6448.33	1158.93	56.34	47.20	473.13	-	109.71	12.84	522.90	3990.48	-	76.80
JULY	2011.73	1152.51	269.95	44.92	394.54	-	82.56	(232.05)	79.70	189.00	-	30.60
AUG	4365.19	1811.11	422.75	28.38	394.54	1051.05	281.86	30.03	272.80	26.92	-	45.75
SEPT	2721.25	1273.47	30.07	25.95	411.48	-	195.97	307.22	186.74	243.10	-	47.25
OCT	1821.37	1190.03	-	20.78	418.08	-	67.85	-	-	-	-	124.63
NOV	1940.46	1178.26	-	32.17	387.94	-	46.28	-	248.72	15.74	-	31.35
DEC	3801.12	1153.83	-	56.89	1007.70	-	386.62	14.11	185.02	952.70	-	44.25
TOTAL	34664.71	15847.09	779.11	629.96	5328.48	1051.05	1755.11	277.88	2533.26	5864.29	-	598.48

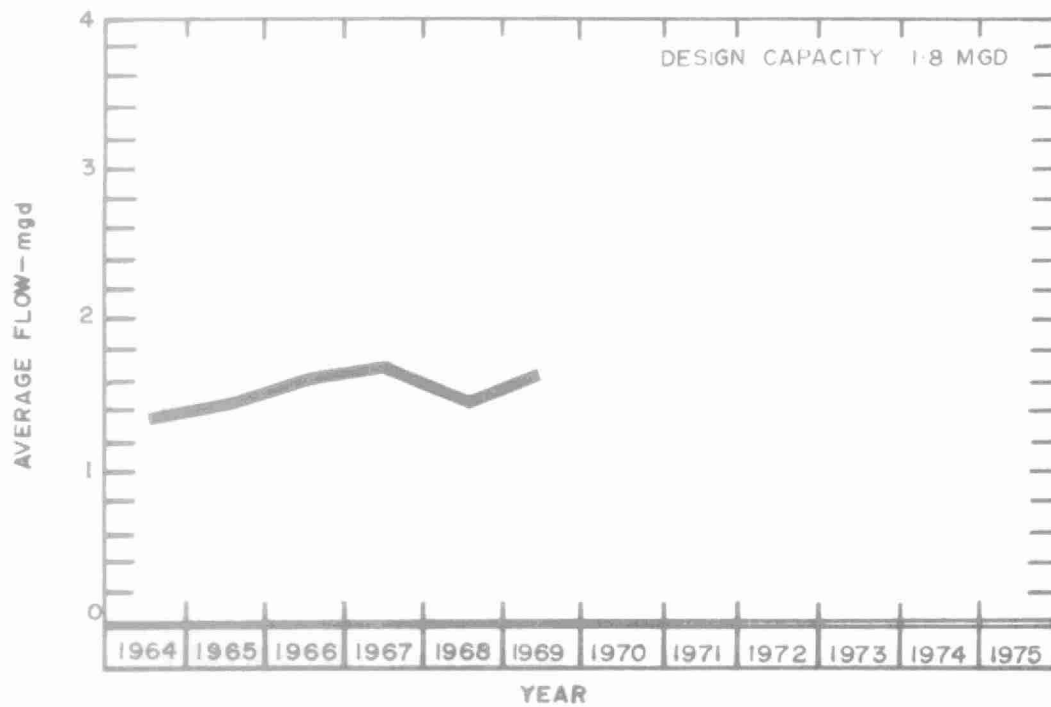
BRACKETS INDICATE CREDIT

* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$1071.00

PROCESS DATA



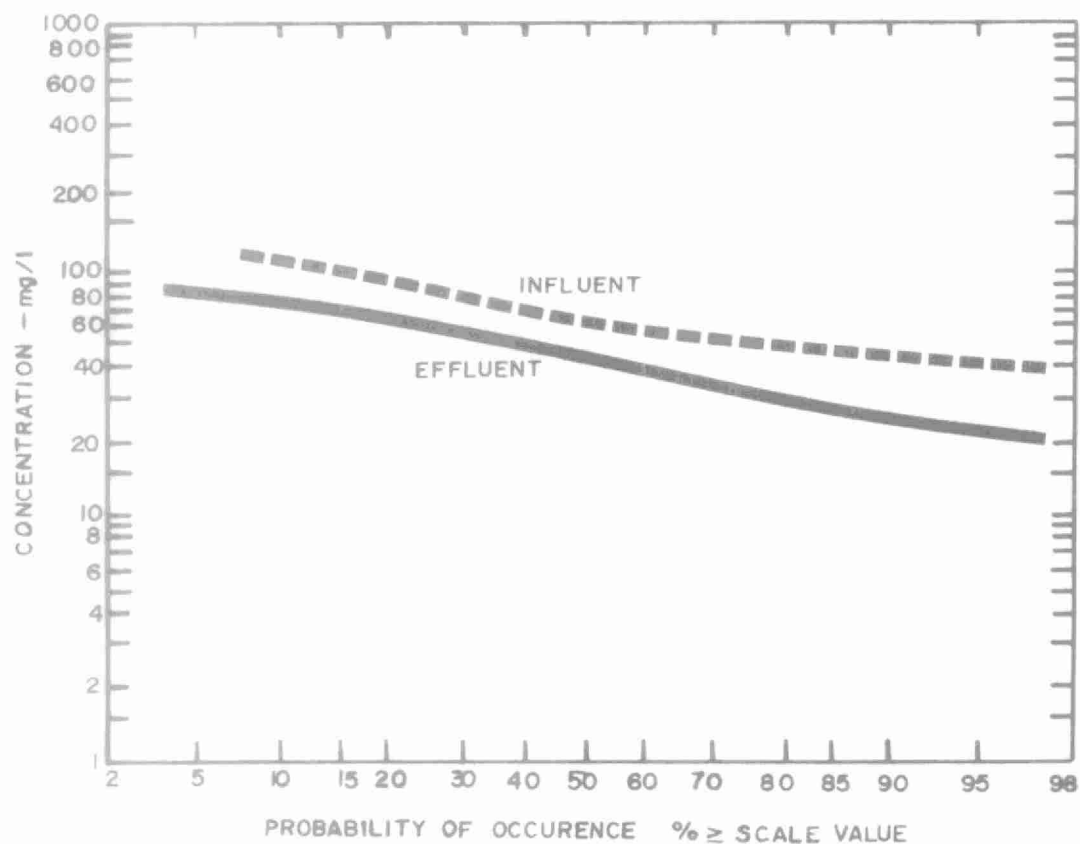
FL O W S



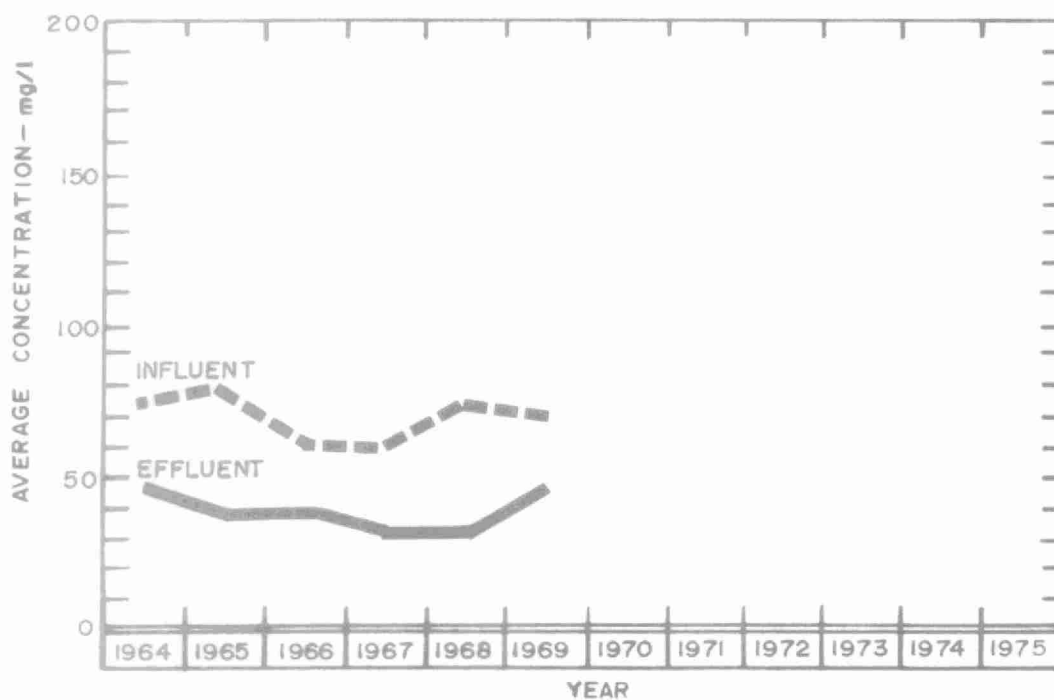
PLANT FLOWS and CHLORINATION

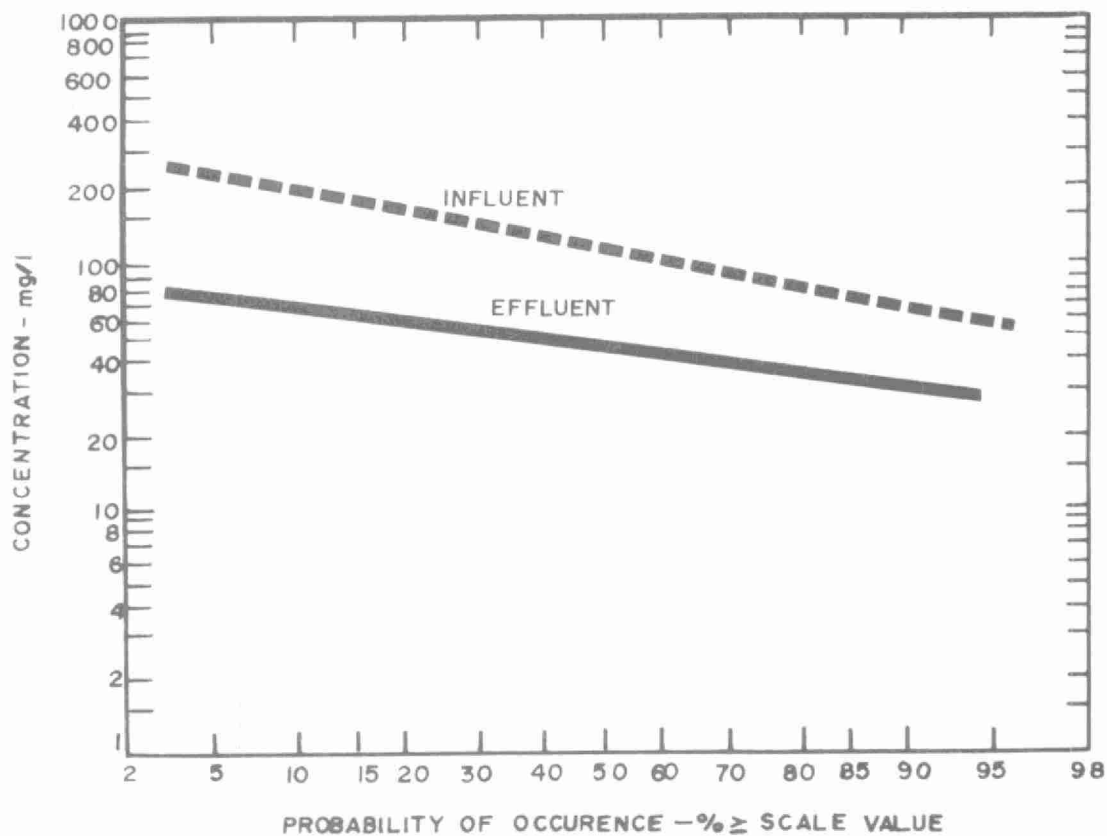
MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED 10 ² pounds	DOSAGE* mg/l
JAN	59.20	1.91	4.94	1.03	2.6	.4
FEB	38.00	1.36	2.89	.83	2.3	.6
MAR	39.63	1.28	2.94	.80	2.7	.7
APR	58.56	1.95	4.10	1.19	4.0	.7
MAY	52.26	1.68	4.15	1.13	15.5	2.2
JUNE	44.67	1.49	3.17	1.07	25.0	4.2
JULY	49.05	1.58	2.70	1.23	29.6	4.5
AUG	49.67	1.60	3.21	1.22	28.6	4.3
SEPT	46.65	1.55	2.83	1.18	27.2	4.3
OCT	43.36	1.40	2.15	1.20	24.3	4.2
NOV	62.55	1.96	4.73	1.25	14.2	1.8
DEC	52.46	1.69	4.74	.95	3.7	.7
TOTAL	596.06	-	-	-	179.7	-
AVERAGE	-	1.63	3.54	1.09	15.0	2.4

* Effluent Dosage

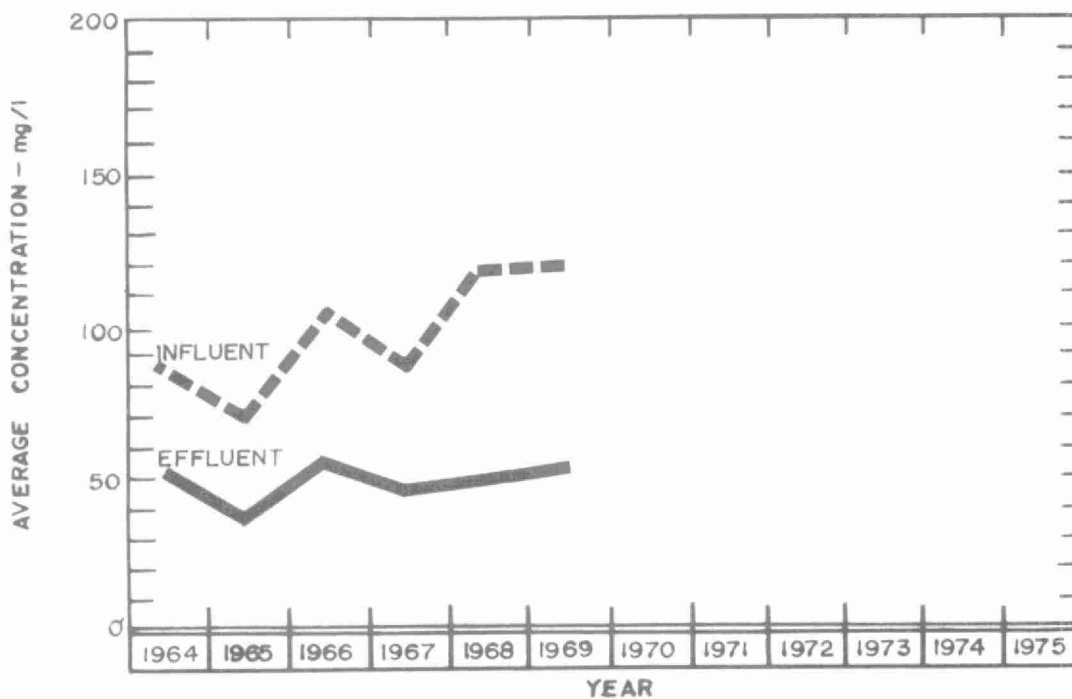


BIOCHEMICAL OXYGEN DEMAND



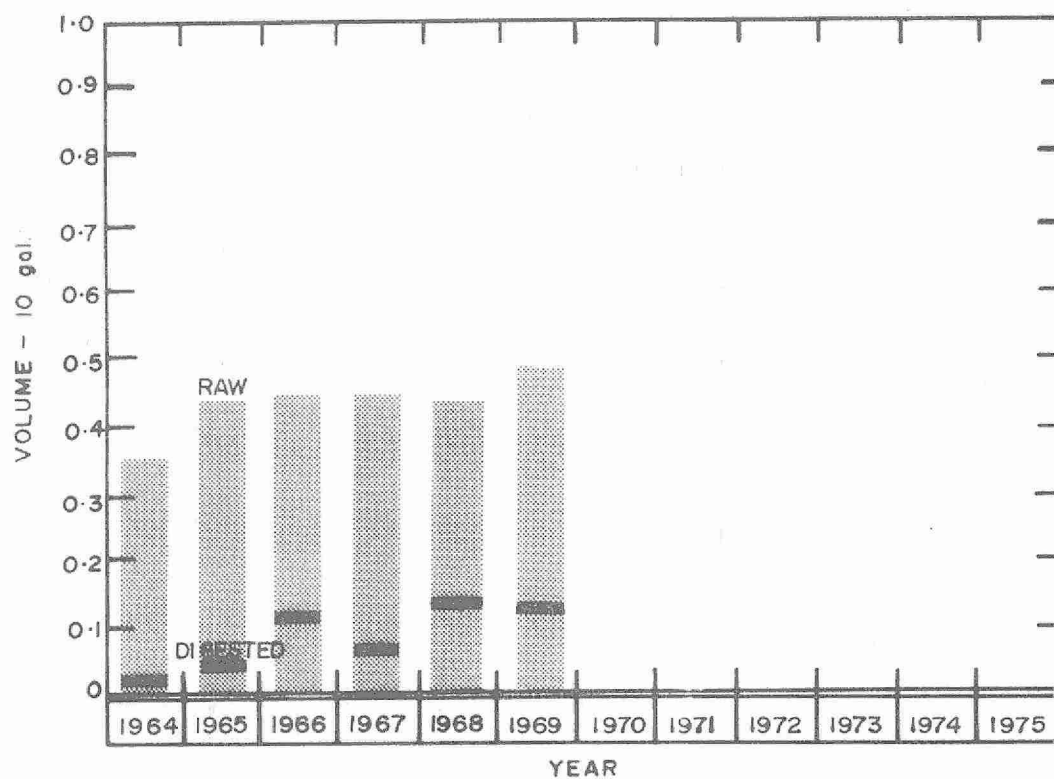


SUSPENDED SOLIDS

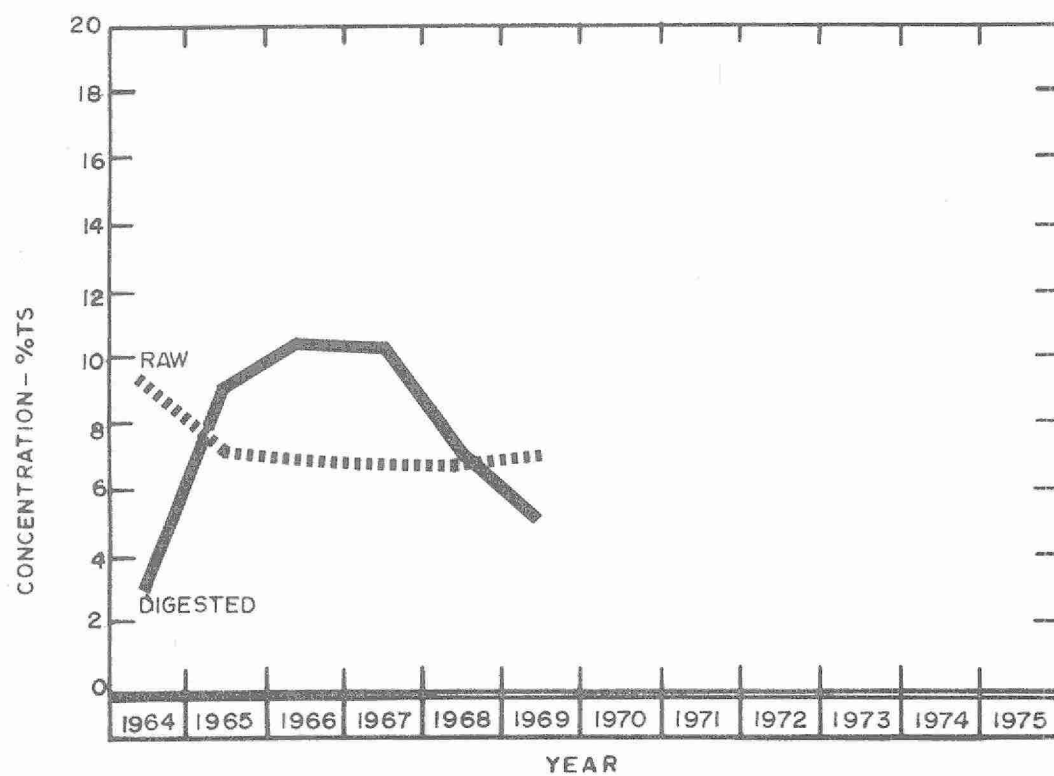


PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT REMOVAL
	INF. mg/l	EFF. mg/l	REDUCTION		INF. CONCN mg/l	EFF. CONCN mg/l	REDUCTION		
			%	10 ³ pounds			%	10 ³ pounds	cu
JAN	81	47	42	20.	115	50	56	38.	6
FEB	65	46	29	7.	125	50	60	28.	1
MAR	77	54	30	9.	120	50	58	28.	3
APR	53	39	26	8.	100	78	27	13.	9
MAY	78	57	7	11.	110	55	25	29.	-
JUNE	70	44	37	12.	90	55	39	16.	13
JULY	60	36	40	12.	160	60	63	49.	9
AUG	109	36	67	36.	95	53	44	21.	4
SEPT	72	58	19	7.	65	60	7	2.	2
OCT	85	73	14	5.	108	35	67	31.	1
NOV	35	25	28	6.	160	51	68	68.	3
DEC	72	39	45	17.	181	37	79	76.	7
TOTAL	-	-	-	-	-	-	-	-	58
AVERAGE	71	46	35	12.	119	52	56	36.	



DIGESTION



SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	DEWATERED	LIQUID
	10 ³ gal	%	%	10 ³ gal	%	%	10 ³ gal	%	cu yd	cu yd
JAN	37.5	6.0	65	34.0	-	-	37.5	.3	0	202
FEB	34.1	6.1	76	0	-	-	35.1	.3	0	0
MAR	37.4	4.8	77	0	7.4	56	37.4	.4	0	0
APR	36.3	6.1	71	0	7.8	58	36.3	.3	0	0
MAY	36.5	5.9	71	40.3	-	-	18.1	.3	0	239
JUNE	37.7	7.7	71	0	-	-	37.1	-	0	0
JULY	40.8	8.4	73	0	-	-	36.8	-	0	0
AUG	44.0	11.5	68	31.8	-	-	44.0	-	0	189
SEPT	40.0	-	-	0	-	-	40.0	-	0	0
OCT	41.9	8.3	77	0	-	-	41.8	-	0	0
NOV	42.0	4.6	68	19.3	5.3	50	35.0	.2	0	0
DEC	40.1	8.9	44	0	-	-	44.4	.2	0	0
TOTAL	486.3	-	-	125.4	-	-	443.5	2.0	0	630
AVERAGE	39.0	7.1	69	0	6.8	54	36.9	.3	0	0

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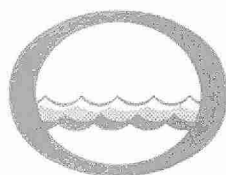
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